LISTING OF CLAIMS

Cancel claims 1-8 without prejudice.

9. (original) A method of determining a rate of rotation of an optical fiber coil about an axis of the coil, comprising:

providing a light source;

providing a phase modulator for shifting the phases of light signals directed into and out of the coil, in response to a modulation waveform;

arranging an optical network for receiving light of a certain intensity from the light source and for dividing the light into a pair of first light signals;

directing the first light signals to counter-propagate through the coil thus defining a corresponding pair of second light signals the phases of which have been shifted by the phase modulator;

interfering the phase-shifted second light signals with one another to produce a recombined light signal having an intensity (I) that is a known function of a total phase difference between the second light signals, and the phase difference includes a Sagnac shift (R) produced when the coil rotates about said axis;

defining the modulation waveform to obtain a determined sequence of at least five phase shifts between the pair of second light signals, including shifts of substantially zero degrees, +90 degrees, -90 degrees, +180 degrees and -180 degrees;

producing measurement signals corresponding to the intensity of the recombined light signal for each overall phase shift in said sequence; and

determining a rotation rate of the optical fiber coil about said axis according to the measurement signals and said known function.

10. (original) The method of claim 9, including defining the intensity of the recombined light signal as;

$I = I_o[1 + \cos(\Phi)] + K$,

wherein:

$2I_o$ = peak intensity of the recombined light signal,

Φ = total phase difference between the second light signals, and

K = a system bias offset.

11. (original) The method of claim 9, including defining the total phase shift (Φ) between the second light signals as;

$\Phi = R + \Theta\mathrm{nom} + \Delta$,

wherein:

R = Sagnac phase shift,

$\Theta\mathrm{nom}$ = nominal modulation phase difference at a given measurement point, and

Δ = phase shift error at the given measurement point.

12. (original) The method of claim 9, including determining the Sagnac shift (R) according to the relation;

$R = \tan^{-1} \{[2(B - C)] / [D + E - 2A]\}$ when $|\tan(R)| \leq 1$, and

$R = \cot^{-1} \{[D + E - 2A] / [2(B - C)]\}$ when $|\cot(R)| \leq 1$,

wherein:

A = value of measurement signal with zero phase shift set by the phase modulator;

B = value of measurement signal with +90 degree phase shift set by the phase modulator;

C = value of measurement signal with -90 degree phase shift set by the phase modulator;

D = value of measurement signal with +180 degree phase shift set by the phase modulator; and

E = value of measurement signal with -180 degree phase shift set by the phase modulator.

13. (original) The method of claim 12, including defining the modulation waveform so that the phase modulator obtains the phase shifts between the second light signals at substantially zero degrees, +90 degrees, -90 degrees, +180 degrees and -180 degrees, in the stated order.

14. (original) The method of claim 9, including defining the modulation waveform so that the sequence of phase shifts set by the phase modulator between the second light signals includes a number of pairs of phase shifts, and the phase shifts of each pair have equal value and opposite sign.

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